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| EXAMINER | |
|---|---|
| DATSKOVSKIY, SERGEY | |

| ART UNIT | PAPER NUMBER |
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| 2121 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/695,385 | CROUCH, SIMON EDWIN | |
| | Examiner | Art Unit | |
| | Sergey Datskovskiy | 2121 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 12-24* is/are rejected.

7)☐ Claim(s) *10 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

1. Claims 1-24 have been submitted for examination.

2. Claims 1-9 and 12-24 have been rejected.

3. Claims 10 and 11 have been objected.

### *Information Disclosure Statement*

4. The information disclosure statement filed December 28, 2003 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered. Specifically, the item 1L (EP1271364A2) was not considered since it lacks an English translation or an English abstract.

### *Specification*

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it is too short and fails to sufficiently describe the invention. The abstract should not include reference numbers, such as "network 5" in line 1. It also should not have "(Figure 4)" text included on line 3. Correction is required. See MPEP § 608.01(b).

6. The disclosure is objected to because of the following informalities: page 9, line 11 refers to non-existent Figs. 3a and 3b. The most likely correction would be Figs. 6a and 6b.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "said network nodes" in line 1. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Objections*

Claim 8 is objected to because of the following informalities: the phrase "*at least one subset of said network nodes are associated together*" is grammatically incorrect. It is also not clear what the claimed limitation means when the subset contains less then two nodes. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5, 8-9, 12-15, 18-19, 22, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Aussem et al. ("Queueing Network Modelling with Distributed Neural Networks for Service Quality Estimation in B-ISDN Networks").

**Claim 1**

Aussem et al. teaches a method of modelling a network (Abstract, models a queuing network) comprising operating said network as a neural network and executing a neural network modelling algorithm on said network (page 392, Introduction, paragraph 2), whereby said network models its own response to a requested action (page 392, Introduction, paragraph 2; a complete queuing system is modeled by a

feedforward neural network, this implies that the network models its own response to actions of queuing input traffic).

**Claim 2**

Aussem et al. teaches a method according to claim 1, wherein said network comprises a plurality of network nodes and at least a subset of said nodes are each arranged to execute a neural network objective function (page 392, lines 6-7 from the bottom; the neural networks are disclosed as being distributed on the switches. It is inherent for a neural network to operate by executing a neural network objective function).

**Claim 3**

Aussem et al. teaches a method according to claim 2, wherein each of said subset of network nodes is arranged to maintain an information vector (page 393, chapter 2, information vector is disclosed as aggregate traffic descriptors).

**Claim 4**

Aussem et al. teaches a method according to claim 3, wherein said information vector is representative of the state of one of the plurality of network nodes (page 393, chapter 2, aggregate traffic descriptors).

**Claim 5**

Aussem et al. teaches a method according to claim 3, wherein each of said subset of network nodes executes said neural network objective function using at least one of said information vectors as an operand (page 392, Introduction, paragraph 2; "*... NN fed with three descriptors of the aggregated input traffic*").

**Claim 8**

Aussem et al. teaches a method according to claim 1, wherein at least one subset of said network nodes are associated together and represented by a single node when said neural network algorithm is executed (page 392, lines 6-7 from the bottom; neural networks having multiple nodes are located on the switches, i.e. nodes of the queuing network).

**Claim 9**

Aussem et al. teaches a method according to claim 8, wherein said neural network modelling algorithm is executed on a sub-network of said network nodes, the sub-network being isomorphic to the network formed by said at least one subset of associated network nodes and remaining network nodes (page 392, lines 6-7 from the bottom, Figure 1; neural network algorithm is being executed on the switches, Figure 1 shows the resulting neural network structure being isomorphic (i.e. having the same structure) as the original queuing network).

**Claim 12**

Aussem et al. teaches a network (Abstract, a queuing network) arranged to operate as a neural network and to execute a neural network modelling algorithm (page 392, Introduction, paragraph 2) in response to a request to execute an action on said network, whereby the network models its own response to the requested action (page 392, Introduction, paragraph 2; a complete queuing system is modeled by a feedforward neural network, this implies that the network models its own response to actions of queuing input traffic).

**Claim 13**

Aussem et al. teaches a network according to claim 12, wherein said network comprises a plurality of network nodes and at least a subset of said nodes are each arranged to execute a neural network objective function (page 392, lines 6-7 from the bottom; the neural networks are disclosed as being distributed on the switches. It is inherent for a neural network to operate by executing a neural network objective function).

**Claim 14**

Aussem et al. teaches a network according to claim 13, wherein each of said subset of network nodes is arranged to maintain an information vector (page 393, chapter 2, information vector is disclosed as aggregate traffic descriptors).

**Claim 15**

Aussem et al. teaches a network according to claim 14, wherein said information vector is representative of the state of one of the plurality of network nodes (page 393, chapter 2, aggregate traffic descriptors).

**Claim 18**

Aussem et al. teaches a network according to claim 14, wherein at least one of said subset of network nodes is arranged to maintain an information vector representative of the state of a plurality of associated ones of said network nodes (page 394, chapter 3.2; a single node with NN is disclosed to model multiple queue nodes).

**Claim 19**

Aussem et al. teaches a network according to claim 18, wherein the plurality of associated network nodes are associated together such that the subset of network nodes maintaining said information vectors conforms to a predetermined topology (page 392, lines 6-7 from the bottom, Figure 1; neural network algorithm is being executed on the switches, Figure 1 shows the resulting neural network structure having the same topology as the original queuing network).

**Claim 22**

Aussem et al. teaches a method of modelling the response of a network, the network comprising a plurality of interconnected data processors (Abstract, models a

queuing network), the method comprising operating at least a portion of the plurality of data processors in accordance with a set of neural network algorithms in response to an input to the network to provide an output (page 392, Introduction, paragraph 2), the neural network algorithms being arranged such that the output is indicative of the expected response of the entire network to the input (page 392, Introduction, paragraph 2; a complete queuing system is modeled by a feedforward neural network, this implies that the network models its own response to actions of queuing input traffic).

**Claim 24**

Aussem et al. teaches a network of dataprocessors comprises a plurality of interconnected dataprocessors (Abstract, models a queuing network), each of a subset of the plurality of dataprocessors being arranged to execute at least one neural network function such that the subset of dataprocessors is operable to emulate the functionality of the plurality of dataprocessors (page 392, Introduction, paragraph 2; a complete queuing system is modeled by a feedforward neural network).

9. Claims 20, 21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Aussem ("Call Admission Control in ATM Networks with the Random Neural Network").

**Claim 20**

Aussem teaches a method of managing the allocation of tasks in a distributed network (Abstract), the method comprising: submitting a task allocation for execution by the network (page 2482, Introduction, paragraph 1; submitted tasks are disclosed as multimedia related data traffic); executing a distributed modelling algorithm on the network, the modelling algorithm being arranged to model the response of the distributed network itself to the submitted task allocation (page 2482, Introduction, paragraph 2; neural network modeling is run on the switches); and determining if the modelled response is acceptable and if so allocating the submitted task to the network (page 2482, Introduction, paragraph 3; discloses calculating delays for the requested tasks, wherein acceptance implies allocating the submitted task to the network).

**Claim 21**

Aussem teaches a method according to claim 21, wherein if said modelled response is not acceptable, modifying the submitted task allocation and repeating said method (page 2482, Introduction, paragraph 3; disclosed by reiterating the algorithm after modifying weights).

**Claim 23**

Aussem teaches a method of managing the operation of a distributed network of dataprocessors (Abstract), the method comprising: prior to the execution of a desired operation on the distributed network, assigning a plurality of neural network functions to

at least a sub-set of the distributed dataprocessors (page 2482, Introduction, paragraph 2; neural network modeling is run on the switches of the queuing network), the neural network functions being arranged such that the sub-set of distributed dataprocessors is operative to model the operation of the entire distributed network of dataprocessors (page 2486, chapter 4, lines 1-5; neural network located on switch nodes models the entire queuing network); modelling the operation of the distributed network in response to the desired operation on the sub-set of distributed dataprocessors (page 2482, chapter 1, paragraph 2; the subset of distributed dataprocessors is disclosed as switches); and where the modelled response falls outside predetermined criteria, modifying the desired operation prior to execution of the modified operation on the distributed network of dataprocessors (page 2482, chapter 1, paragraph 3; disclosed by reiterating the algorithm after modifying weights).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aussem et al. ("Queueing Network Modelling with Distributed Neural Networks for Service Quality Estimation in B-ISDN Networks").

**Claim 6**

Aussem et al. teaches a method according to claim 1.

Aussem et al. does not expressly teach that a warning is issued if the modelled response to the requested action fails to conform to at least one predetermined criteria.

However, Examiner takes an Official Notice, that issuing a warning when an action fails to conform to a predetermined criteria was well known in the art of computer programming at the time the invention was made.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to issue a warning if the modelled response to the requested action fails to conform to at least one predetermined criteria since Examiner takes Official Notice that issuing a warning is well known in the art and could be used to warn user of a detected failure condition.

**Claim 16**

Aussem et al. teaches a method according to claim a network according to claim 13.

Aussem et al. does not expressly teach that at least one of said network nodes is arranged to generate a warning if the modelled response to the requested action does not conform to at least one predetermined criteria.

However, Examiner takes an Official Notice, that issuing a warning when an action fails to conform to a predetermined criteria was well known in the art of computer programming at the time the invention was made.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to issue a warning if the modelled response to the requested action fails to conform to at least one predetermined criteria since Examiner takes Official Notice that issuing a warning is well known in the art and could be used to warn user of a detected failure condition.

11. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aussem et al. ("Queueing Network Modelling with Distributed Neural Networks for Service Quality Estimation in B-ISDN Networks") in view of Aussem ("Call Admission Control in ATM Networks with the Random Neural Network").

**Claim 7**

Aussem et al. teaches a method according to claim 1.

Aussem et al. does not expressly teach that said requested action is not committed if the modelled response to the requested action fails to conform to at least one predetermined criteria.

However, Aussem teaches that said requested action is not committed if the modelled response to the requested action fails to conform to at least one predetermined criteria (page 2485, chapter 3, lines 1-4).

Aussem and Aussem et al. are analogous art since they are both directed to modelling queuing networks. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include rejecting requested actions from Aussem

(page 2485, chapter 3; disclosed as exceeding an admission function) and combine it with the queuing network model from Aussem et al. The reason for combining would be to extend the system of Aussem by modeling several interconnected queuing systems running in parallel (Aussem et al., page 393, last paragraph). Therefore, it would have been obvious to modify Aussem et al. in view of Aussem by rejecting a requested action when it fails to conform to a predetermined criteria.

**Claim 17**

Aussem et al. teaches a network according to claim 12

Aussem et al. does not expressly teach that said requested action is not executed if the modelled response does not conform to at least one predetermined criteria.

However, Aussem teaches that said requested action is not executed if the modelled response does not conform to at least one predetermined criteria (page 2485, chapter 3, lines 1-4).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include rejecting requested actions from Aussem (page 2485, chapter 3; disclosed as exceeding an admission function) and combine it with the queuing network model from Aussem et al. using the same motivation as in claim 7 above.

### *Allowable Subject Matter*

Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: As per claim 10, the prior art of record taken alone or in combination fails to teach that the resulting network is isomorphic to a predetermined sub-network of network nodes. Claim 11 is indicated allowable based on its dependency on the allowable claim 10.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Uchiyama et al. (US Patent No. 5,404,423) teaches method and apparatus for identification, forecast, and control of a non-linear flow on a physical system network using a neural network. Hanes et al. (US Patent No. 5,440,719) teaches method simulating data traffic on network in accordance with a client/sewer paradigm. Pechanek et al. (US Patent No. 5,509,106) teaches a distributed modeling of neural network. Tamiya (US Patent No. 5,659,486) teaches modeling a physical distribution network with a neural network. Boda et al. (US Patent No. 5,687,292) teaches device and method for determining a distribution of resources of a physical

network. Osborn et al. (US Patent No. 6,327,591) teaches adaptive distributed information network. Kambhatla et al. (US Patent No. 6,418,423) teaches method and apparatus for executing neural network applications on a network of embedded devices. Mulgund et al. (US App. No. 2002/0161751) teaches a system for and method of relational database modeling of ad hoc distributed sensor networks.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sergey Datskovskiy whose telephone number is (571) 272-8188. The examiner can normally be reached on Monday-Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight, can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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